

THIRD AUXILIARY REQUEST

Claims

1. A refrigerant composition which comprises:

- (i) ~~pentafluoroethane, 1,1,1,2- or 1,1,2,2-tetrafluoroethane, 1,1-difluoroethane, trifluoromethoxypentafluoroethane, 1,1,1,2,3,3,3-heptafluoropropane or 1,1,1,2,2,3,3-heptafluoropropane, or a mixture of two or more thereof, in an amount from 50 to 50% by weight based on the weight of the composition~~ *n-butane*
 (ii) ~~an unsubstituted hydrocarbon of the formula C_nH_m , in which n is at least 4 and m is at least $2n-2$ other than methyl propane, in an amount from 1 to 4% by weight based on the weight of the composition.~~

with the remainder, not exceeding 60% by weight based on the weight of the composition, being:

- (iii) ~~pentafluoroethane, trifluoromethoxydifluoromethane or hexafluorocyclopropane, or a mixture of two or more thereof.~~

2. ~~A composition according to claim 1 wherein component (i) is present in an amount of 50% by weight based on the weight of the composition.~~

3. ~~A composition according to claim 1 or 2 wherein component (i) is 1,1,1,2-tetrafluoroethane or a mixture of said ethane with pentafluoroethane.~~

4. ~~A refrigerant composition which comprises:-~~

- ~~(i) pentafluoroethane, 1,1,1,2- or 1,1,2,2-tetrafluoroethane, 1,1-difluoroethane, trifluoromethoxypentafluoroethane, 1,1,1,2,3,3,3-heptafluoropropane or 1,1,1,2,2,3,3-heptafluoropropane, or a mixture of two or more thereof, in an amount from 50 to 75% by weight based on the weight of the composition~~
~~(ii) an unsubstituted hydrocarbon of the formula C_nH_m , in which n is at least 4 and m is at least $2n-2$, other than methyl propane, in an amount from 1 to 4% by weight based on the weight of the composition; with the remainder being~~
~~(iii) pentafluoroethane, trifluoromethoxydifluoromethane or hexafluorocyclopropane, or a mixture of two or more thereof.~~

5. ~~A composition according to claim 4 wherein component (i) is 1,1,1,2-tetrafluoroethane or a mixture of said ethane with pentafluoroethane.~~

6. ~~A composition according to claim 4 or 5 wherein component (iii) is pentafluoroethane.~~

7. ~~A refrigerant composition which comprises:-~~

- ~~(i) 1,1,1,2- or 1,1,2,2-tetrafluoroethane, or a mixture of pentafluoroethane and 1,1,1,2- or 1,1,2,2-tetrafluoroethane, in an amount from 30 to 94% by weight based on the weight of the composition,~~
~~(ii) an unsubstituted hydrocarbon of the formula C_nH_m in which n is at least 4 and m is at least $2n-2$, other than methyl propane, in an amount from 1 to 4% by weight based on the weight of the composition,~~
~~(iii) pentafluoroethane in an amount from 5 to 60% by weight based on the weight of the composition with the proviso that the concentration of pentafluoroethane in the composition is not 5 to 20% by weight based on~~

~~the weight of the composition.~~

- ² 8. A composition according to ~~any one of the preceding claims~~ ^{claim 1} wherein component (ii) is present in an amount from 2 to 4% by weight based on the weight of the composition.
- ⁵ 3 9. A composition according to claim ² 8 wherein component (ii) is present in an amount from 3 to 4% by weight based on the weight of the composition.
- ¹⁰ 10. ~~A composition according to any one of the preceding claims wherein component (ii) is a mixture of said hydrocarbons.~~
11. ~~A composition according to any one of the preceding claims wherein component (ii) comprises a hydrocarbon which possesses 4 or 5 carbon atoms.~~
- ¹⁵ 12. ~~A composition according to claim 11 wherein component (ii) comprises a hydrocarbon which is n-butane.~~
- ⁴ 13. A composition according to ~~claim 12~~ ^{any one of the preceding claims} which comprises:
- ²⁰ (a) 46 to 46.5% by weight of pentafluoroethane
(b) 50 % by weight of 1,1,1,2-tetrafluoroethane and
(c) 4 to 3.5% by weight, respectively, of n-butane.
- ⁵ 14. Use as a refrigerant of a composition as claimed in any one of claims 1 to ⁴ 13.
- ²⁵ ⁶ 15. Use according to claim ⁵ 14 in a refrigeration or airconditioning system designed to use chlorodifluoromethane as refrigerant.
16. ~~Use of a refrigeration composition which comprises:~~
- ³⁰ (i) ~~pentafluoroethane, 1,1,1,2- or 1,1,2,2-tetrafluoroethane, 1,1-difluoroethane, 1,1,1,2,3,3,3-heptafluoropropane or 1,1,1,2,2,3,3-heptafluoropropane, or a mixture of two or more thereof, in an amount from 30 to 94% by weight based on the weight of the composition and~~
- ³⁵ (ii) ~~an unsubstituted hydrocarbon of the formula C_nH_m in which n is at least 4 and m is at least 2n-2, other than methyl propane, in an amount from 1 to 10% by weight based on the weight of the composition, as a replacement for chlorodifluoromethane.~~
- (iii) ~~pentafluoroethane in an amount from 5 to 60% by weight based on the weight of the composition, as a replacement for chlorodifluoromethane.~~
- ⁴⁰ 17. ~~Use according to claim 16 wherein the composition is as defined in claim 13.~~
- ⁷ 18. The process for producing refrigeration which comprises evaporating a composition as claimed in any one of claims 1 to ⁴ 15 in the vicinity of a body to be cooled.
- ⁸ 19. A refrigeration apparatus containing, as refrigerant, a composition as claimed in any one of claims 1 to ⁴ 18.
- ⁴⁵ 9 20. A refrigeration apparatus according to claim ⁸ 19 which is designed to use chlorodifluoromethane as refrigerant.

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Claims

- 5 1. A refrigerant composition which comprises:
- (i) 1,1,1,2-tetrafluoroethane, in an amount of 50% by weight based on the weight of the composition,
 - (ii) n-butane, in an amount from 1 to 4% by weight based on the weight of the composition,
 - 10 with the remainder, not exceeding 60% by weight based on the weight of the composition, being:
 - (iii) pentafluoroethane.
2. A composition according to claim 1 wherein component (ii) is present in an amount from
- 15 2 to 4% by weight based on the weight of the composition.
3. A composition according to claim 2 wherein component (ii) is present in an amount from
- 3 to 4% by weight based on the weight of the composition.
- 20 4. A composition according to any one of the preceding claims which comprises:
- (a) 46 to 46.5% by weight of pentafluoroethane,
 - (b) 50 % by weight of 1,1,1,2-tetrafluoroethane and
 - (c) 4 to 3.5% by weight, respectively, of n-butane.
- 25 5. Use as a refrigerant of a composition as claimed in any one of claims 1 to 4.
6. Use according to claim 5 in a refrigeration or airconditioning system designed to use chlorodifluoromethane as refrigerant.
- 30 7. The process for producing refrigeration which comprises evaporating a composition as

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claimed in any one of claims 1 to 4 in the vicinity of a body to be cooled.

8. A refrigeration apparatus containing, as refrigerant, a composition as claimed in any one of claims 1 to 4.

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9. A refrigeration apparatus according to claim 8 which is designed to use chlorodifluoromethane as refrigerant.